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the effects of stimulation on the cell, including chemical, mechanical, photic, electric irritations, with discussions of chemotropic, barotropic, heliotropic, thermotropic and galvanotropic phenomena, and also sections on fatigue and exhaustion.

The author shows throughout that he has received a sound scientific training, that he has a good grasp of his subject since he handles all its themes firmly and successfully, so that his book will be found very useful to those who in their teaching wish to give due prominence to the fundamental principles of biology.

In another edition there will be many changes and additions to make, which will improve the work and render it a more adequate representative of the present status of general physiology. So long as the author deals with philosophical aspects of the subjects it must be deemed a serious omission not to include consciousness. We may note other omissions, such as the phenomena of senescence and growth as a function of age, an omission which is significant to me personally, owing to my having long been specially interested in senescence as a biological problem. Again, the difference between sex and sexuality is left unconsidered; the theory of the vital force as having a ferment-like effect, the causation and laws of variability, concerning which a good deal is known, and finally many minor points, which are known to this and that specialist, all suggest opportunities for improvement. None the less the book as a whole is to be commended, for it takes a great step towards bringing order in a field of science still chaotic, and it is to be hoped that it will become well known in American Laboratories.

CHARLES S. MINOT.

Ice Bound on Kolguev. By A. TREVOR-BATTYE, London, Constable. 1895. Pp. xxviii. and 458. Three maps and numerous illustrations.

The small Arctic island which forms the subject of this sketch is an interesting place, as it lies just within the Polar circle, to the north of Russia, between the entrance to the White Sea and the mouth of the River Petchora.

The two attempts which were made to colonize the island in the latter half of the eighteenth century resulted in failure; and at

the present time the Samoyede families who eke out a miserable existence there can hardly be called a successful venture in that line, because the conditions of life force them to a nomadic career, which puts an end to all development.

With regard to the structure of the island, the author was not able to find any trace of the rocky character which has usually been assigned to it. He describes the surface as one composed mainly of sandy hills, which are confined to the central and northern portions, while the southern districts are occupied by tundras of considerable extent. The soil of these tundras, frozen solid during a great part of the year, and only thawed out to a depth of a few feet at best during the summer, limits the amount of the food supply in the most thoroughgoing manner.

About 110 plants have been reported from the island and of these 95 were secured by the author. He also records 47 birds and 6 mammals.

The descriptions given in the book, particularly those of the birds and their habits and the portions devoted to the plants, are well done, and much interesting information has been put in a very agreeable form; here and there, however, one occasionally detects in the effusive style the zeal of the 'glorified naturalist.'

The volume is in the main well written, but some portions would be apt to cause the grammarians to shudder. As, for example, where we are told that "Powys kept our spirits up with the banjo, and we sang, skinned and ate many figs" (p. 52).

Our naturalist has done much painstaking work in spite of the comparatively hurried character of his trip. It is, however, to be regretted that the portions upon the Samoyedes and their manners and customs were not more carefully expanded. Enough is said to whet the appetite for more. On this island we find perhaps one of the few remaining opportunities for the study of a nearly pure form of bolvan worship; and if the author had not allowed his feelings of civilized disgust at some of the native performances to get the better of him, he might have worked himself more thoroughly into their good graces, and given us some insight into the rites of Nûm, the Arctic god. As it is, the subject is dismissed with a footnote and an ac-

count of the superstitious dread of the Russian sailors, which was produced by the knowledge that he had at least one of these 'rag dolls' on board of their vessel.

He cites the Eskimo as observers of this form of worship, but as far as they are concerned it is hardly possible that such is the case. They believe in spirits, but have not personified or individualized them in the shape of idols. The opportunities to investigate such characteristics are getting more and more rare each year, and it is a pity that any are missed.

The author has evidently not learned one of the essentials of a good explorer, and that is the ability to take things as they come. There is a sort of spirit of sad reluctance in the statement, "For breakfast we warmed our last night's lamp, pulled the wick out, and then ate the grease with black bread. It was not a *recherché* meal, but it was economical." There are instances all through the book of an evident feeling of dislike, or perhaps unrest, under the circumstances, which is hardly consonant with the best work. One is almost constrained to say that no one should venture into the field as a naturalist who is not willing to deny himself, in all matters of private convenience, for the sake of the object in view. Nothing is more apt to betray a man so quickly as an expression of his likes and dislikes.

It is to be regretted that their vessel, the Saxon, was allowed to run away with the dredges, alcohol and bottles for their work; since through this neglect they were deprived of the chance of bringing back a much larger amount of material.

There is much enjoyable reading to be found between the covers of this volume, more, perhaps, than is usually the case in books of travel. The formula for finding one's pathway after the fashion of the Cree Indian, upon pages 123 and 124, is not to be recommended to the average traveller who has strayed from his bearings. It is only the keen observer of little things who can 'shut his eyes,' think over the trail of some hours past, locate a given object and then proceed straight to it. Ordinary mortals had much better stick to their compasses, and not try to imitate the power of a genius, or even attempt to do what they have seen those who undoubtedly

possessed a large knowledge of the country do with comparative ease. The reviewer has often been through such experiences, and at first they seemed marvelous evidences of power, but later information dispelled much of the haze of glory which enveloped them. Still, we can all thank the writer for a good story well told.

A single word should be said upon the character of the illustrations. They are uniformly of a high character, and much taste has been shown in their selection. They are an ornament to the book as well as a help to the reader, and their execution is in almost every instance a credit to the designer. Of the maps, that of the island, and that showing the distribution of the ice fields about the island, are noteworthy. They are a valuable addition to our knowledge of this part of the globe, which now serves only to support the few families, who are in reality the Samoyede partners of the Russian traders from the district of Archangel.

The book is most cordially recommended to all lovers of books of travel.

WILLIAM LIBBEY, JR.

Major James Rennell and the Rise of Modern English Geography. By CLEMENTS R. MARKHAM, President of the Royal Geographical and of the Hakluyt Societies. New York, Macmillan. 1895. The Century Science Series. Pp. 232. \$1.25.

Rennell is pronounced, on the excellent authority of Markham, to be 'the first great English geographer.' He early gained an outdoor experience in a seven-year service as a midshipman in the navy, and then in 1764 was to his surprise appointed Surveyor General of Bengal at the youthful age of twenty-one. He returned to England in 1777 and resided there until his death in 1830. After completing his Bengal Atlas he turned from field surveying and became a deep student of geography, ancient and modern, of lands and of seas. It is noted that he was 'depressed by the aspect of public affairs and the wretched mismanagement of the American Revolutionary War.' It was in his later years, while a neighbor and associate of Sir Joseph Banks, that the element of attractive personality and invigorating companionship appears strongly in this biography.